

Sup. Court, U. S.

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In the
SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1975

75-1846

No. _____

CMI CORPORATION,
Petitioner,

VERSUS

LAKELAND CONSTRUCTION Co., Inc., and
MILLER FORMLESS Co., Inc.,
Respondents.

**PETITION FOR WRIT OF CERTIORARI TO THE
UNITED STATES COURT OF APPEALS FOR THE
SEVENTH CIRCUIT**

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June, 1976

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**PETITION FOR WRIT OF CERTIORARI TO THE
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SEVENTH CIRCUIT**

CMI Corporation, prays that a Writ of Certiorari issue to review the judgment of the United States Court of Appeals for the Seventh Circuit entered in the above entitled case on March 24, 1976, a copy of said judgment being appended hereto as Appendix B.

CITATIONS TO OPINIONS BELOW

The opinion of the United States Court of Appeals for the Seventh Circuit was not published and a copy thereof is appended hereto as Appendix C. The Findings of Fact and Conclusions of Law of the District Court are appended hereto as Appendix D.

JURISDICTION

The date of the judgment of the Court of Appeals (Appendix B) was March 24, 1976, and said judgment was entered on March 24, 1976.

Jurisdiction is conferred upon this Court to review the judgment of the Court of Appeals by Writ of Certiorari by the United States Code, Title 28 § 1254(1).

QUESTIONS PRESENTED

1. When two patent applications by the same inventors were co-pending, is the patent which issued on the first filed application part of the prior art to the patent which issued on the second application within the intent and meaning of the "obviousness" statute, 35 U.S.C. § 103?

2. Where the claims of two patents issued from co-pending applications to the same inventors at different times and cover different structures, does a disclaimer of the terminal portion of the second patent to issue which extends beyond the expiration date of the first patent overcome the defense of double patenting? (35 U.S.C. § 101).

3. Is infringement avoided by use of structures well known in the art to be interchangeable?

CONSTITUTIONAL PROVISIONS INVOLVED

The Congress shall have power—To promote the Progress of Science and Useful Arts by securing for limited Times to Authors and Inventors the Exclusive Right to their Writings and Discoveries. United States Constitution, Article I, Section 8, Clause 8.

STATUTORY PROVISION INVOLVED

The Statutes involved are Sections 101, 103 and 281 of the Patent Act of 1952, c. 950, § 1, 66 Stat. 797, 35 U.S.C. § 101; c. 950, § 1, 66 Stat. 798, 35 U.S.C. § 103; c. 950, § 1, 66 Stat. 812, 35 U.S.C. § 281. (Appendix A)

STATEMENT OF THE CASE

This action was commenced by petitioner CMI Corporation against respondents, Lakeland Construction Co., Inc., and Miller Formless Co., Inc., seeking an injunction and an accounting for infringement of a patent owned by petitioner. Respondent, Miller Formless Co., Inc., is a manufacturer of equipment which petitioners contend infringe petitioner's patent and respondent, Lakeland Construction Co., is a user of said machines. The case was tried to the District Court sitting without a jury on June 3 through 7 and June 10, 1974.

On January 24, 1975, the Honorable Richard W. McLaren, rendered judgment in favor of respondents (Appendix D).

Upon appeal to the United States Court of Appeals for the Seventh Circuit, that Court affirmed the judgment of the District Court in an unpublished per curiam memorandum opinion (Appendix C).

In its memorandum opinion, the Court of Appeals failed to respond to the petitioner's arguments with respect to the questions presented herein and its opinion is contrary to the previous law of the Seventh Circuit and other circuits.

REASONS FOR GRANTING THE WRIT

The District Court erroneously included the disclosure contained in another of petitioner's patents as a pertinent portion of the prior art in reaching its conclusion that petitioner's patent-in-suit was "obvious" under the authority of *Graham v. John Deere Co.*, 383 U.S. 1 (1966). (Finding of Fact 72, Appendix D, page 28.) The applications which resulted in the two patents were admittedly co-pending and the earlier issued patent used to render the patent-in-suit "obvious" was admittedly the "parent" of the patent-in-suit. The Court of Appeals for the Seventh Circuit simply commented that the District Court had properly applied the prescribed criteria for "obviousness" as set forth in *Graham v. John Deere Co.*, *supra*, and made no comment with respect to the erroneous inclusion of a co-pending parent patent in the prior art heavily relied on to invalidate the same inventors' later issued patent. Petitioner urges that it is a matter of long standing law in the lower courts that a patentee's prior patent is not "prior art" within the meaning of 35 U.S.C. § 103 when the application for the prior patent was pending at the time the application for the patent-in-suit was filed. *General Tire and Rubber Company v. Fisk Rubber Corporation*, 104 F.2d 740 (6th Cir. 1939); *Application of Land and Rogers*, 368 F.2d 866 (C.C.P.A. 1966). This Court should rule on this important issue. Petitioner submits that the District Court relied heavily on petitioner's parent patent and the exclusion of that patent from the pertinent prior art would dramatically alter the District Court's determination of the "obviousness" of the patent-in-suit.

The District Court further concluded, and the Court of Appeals for the Seventh Circuit affirmed, that by misapplying the appropriate rule as to Terminal Disclaimers, the petitioner's patent could be made invalid for double patenting. The District Court and the Court of Appeals did not dispute petitioner's position that the Terminal Disclaimer overcame the defense of double patenting, but merely iterated that the Terminal Disclaimer was not timely filed, even though it was filed before trial. (Conclusions of Law, 10, 11 and 12, Appendix D, pages 39, 40; Appendix C.)

The record in this case is clear that the claims of the two patents cover different, not the same, structures. Petitioner submits that the filing of the Terminal Disclaimer before the trial of this case overcame any question of double patenting, and the conclusions of the District Court and the Court of Appeals are against the weight of authority. *In re Frilette*, 423 F.2d 1397 (C.C.P.A. 1970); *J. R. Clark Co. v. Jones & Laughlin Steel Corp.*, 288 F.2d 279 (7th Cir. 1961). This Court should rule on the effectiveness of Terminal Disclaimers, as well as the timeliness thereof.

The District Court finally concluded, and the Court of Appeals for the Seventh Circuit affirmed, that, even if petitioner's patent was valid, it would not be infringed by the respondents' structure because four endless tracks on a mainframe are distinctly different from two endless tracks as called for in the patent and result in improved steering capabilities. Petitioner submits that the record shows without doubt that four track and two track assemblies were well known to be interchangeable in the pertinent art and

the decisions of the lower courts in this case are directly contrary to this Court's decision in *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605 (1950).

CONCLUSION

For the foregoing reasons, this Petition for Writ of Certiorari should be granted.

Respectfully submitted,

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June, 1976

APPENDICES

APPENDIX A

PATENT ACT OF 1952, C. 950, § 1, 66 STAT. 797,
35 U.S.C. § 101

§ 101. Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

PATENT ACT OF 1952, C. 950, § 1, 66 STAT. 798,
35 U.S.C. § 103

§ 103. A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

PATENT ACT OF 1952, C. 950, § 1, 66 STAT. 812,
35 U.S.C. § 281

§ 281. A patentee shall have remedy by civil action for infringement of his patent.

APPENDIX B

Unpublished Per Curiam Order

United States Court of Appeals
FOR THE SEVENTH CIRCUIT
Chicago, Illinois 60604

MARCH 24, 1976

Before

Hon. TOM C. CLARK, Associate Justice*

Hon. THOMAS E. FAIRCHILD, Chief Judge

Hon. WILBUR F. PELL, JR., Circuit Judge

CMI CORPORATION,
Plaintiff-Appellant,
Cross-Appellee,

No. 75-1264 & 75-1265 vs.

LAKELAND CONSTRUCTION CO.,
INC. and MILLER FORMLESS
CO., INC.,
Defendants-Appellees,
Cross-Appellants.

Appeal from the
United States
District Court
for the Northern
District of Illinois
Eastern Division
No. 72 C 106
Richard W. Mc-
Laren, Judge.

This cause came on to be heard on the transcript of the record from the United States District Court for the Northern District of Illinois, Eastern Division, and was argued by counsel.

On consideration whereof, it is ordered and adjudged by this court that the judgment of the said District Court in this cause appealed from be, and the same is hereby, **AFFIRMED**, in accordance with the order of this court entered this date. Costs of appeal are awarded to defendants.

*Associate Justice (Retired) Tom C. Clark of the Supreme Court of the United States is sitting by designation.

APPENDIX C

United States Court of Appeals

For the Seventh Circuit

Chicago, Illinois 60604

(ARGUED JUNE 13, 1975)

MARCH 24, 1976

Before

Hon. TOM C. CLARK, Associate Justice*

Hon. THOMAS E. FAIRCHILD, Chief Judge

Hon. WILBUR F. PELL, JR., Circuit Judge

CMI CORPORATION,
Plaintiff-Appellant,
Cross-Appellee,

Nos. 75-1264 & 1265 vs.

LAKELAND CONSTRUCTION CO.,
INC. and MILLER FORMLESS
CO., INC.,
Defendants-Appellees,
Cross-Appellants.

Appeal from the
United States
District Court
for the Northern
District of Illinois
Eastern Division
No. 72 C 106
RICHARD MC-
LAREN, Judge.

ORDER

We are asked in plaintiff's appeal to review the order of the district court which found that the claims 3, 5, and 8 of Patent 3,249,026 are invalid and that, even if valid, the defendants' concrete laying slip form machines did not infringe these claims. The defendants have appealed from the denial of attorneys' fees.

*Associate Justice (Retired) Tom C. Clark of the Supreme Court of the United States is sitting by designation.

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The district court made findings of fact with great care, and set forth separate conclusions of law, recognizing expressly that portions of the findings may really be conclusions of law. This is particularly true with respect to obviousness.

Patent 3,249,026, entitled "Construction Machines" was issued May 3, 1966 on an application filed July 3, 1962. The district court rejected defendants contentions (1) that the 3,249,026 patent in suit was anticipated and (2) that the specifications and claims were so indefinite as not to comply with 35 U.S.C. §112.

With respect to obviousness, the court concluded that because of prior art not considered by the Patent Office, the claims in suit do not enjoy the statutory presumption of validity, and that a person skilled in the art would have found the claimed combination obvious. The findings fully complied with the requirements of *Graham v. John Deere Co.*, 383 U.S. 1 (1966). Appellant has not persuaded us that any finding of fact is clearly erroneous, nor that the conclusion of obviousness is an error.

"The district court agreed with defendants' contention that the 3,249,026 patent was invalid for double patenting. The applications for the 3,249,026 patent and Patent 3,230,846, issued January 25, 1966 to the same inventors, were co-pending. The district court concluded that the difference between the subject matter of the two was well known and obvious, and that the subject matter of 3,249,026 was not patentable over 3,230,846. Plaintiff filed a disclaimer, immediately before trial, giving up the protection of 3,249,026 after the expiration of 3,230,846. The district court concluded that this late action did not avoid the double patenting defense. Although plaintiff points out an inaccuracy in the district court's assertion of the date the defense was first pleaded, plaintiff has not persuaded us that the court erred in its conclusion."

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With respect to the claim of infringement, assuming the claims were valid, the findings described the structure and functioning of the accused machines, the Miller Formless curb and gutter machines, Models 70 and 71. The court found sufficient real difference in structure and function between the accused machines and the claims so that the doctrine of equivalents is not applicable. The principal difference arises out of the four endless track system of the accused machines, and the steering capabilities resulting from their arrangement, as compared to the two endless track system of the 3,249,026 patent. The court found and concluded that there would be no infringement even if the claims were valid. We agree.

Defendants appeal from the denial of their attorneys' fees. Although the district court found that the inventors failed to make known to the Examiner certain developments in roadbuilding machinery with which they had had experience long before they filed their application, expressed concern that no real translation of a relevant German patent was made by plaintiff's agent, and found that plaintiff's agent failed to advise the Patent Office of certain prior art patents of which the agent was aware, the court concluded that this was not an exceptional case within the meaning of 35 U.S.C. §285. We find no abuse of discretion.

The Clerk of this Court is directed to enter judgment affirming the judgment appealed from. Costs of appeal are awarded to defendants.

APPENDIX D

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

CMI CORPORATION,)
a corporation,)
Plaintiff,)
v.) No. 72 C 106
LAKELAND CONSTRUCTION CO., INC.,)
a corporation, and MILLER)
FORMLESS CO., INC., a corporation,)
Defendants.)

FINDINGS OF FACT
AND
CONCLUSIONS OF LAW

INTRODUCTION

This is a patent infringement action by CMI Corporation against the Lakeland Construction Co., Inc. and the Miller Formless Co., Inc. for infringement of United States Letters Patent 3,249,026. Defendants have filed a declaratory judgment counterclaim alleging invalidity of the patent and non-infringement. The case was tried to the Court, and having examined all of the testimony and exhibits presented, and being full advised in the premises, the Court finds that patent 3,249,026 is invalid. Furthermore, even if the patent were valid, it would not be infringed.

The following shall constitute the Court's findings of fact and conclusions of law pursuant to Fed.R.Civ.P. 52(a).

FINDINGS OF FACT

The Action and the Parties

1. This is an action for infringement of United States Letters Patent No. 3,249,026 (hereinafter cited as '026), entitled "Construction Machines," issued on May 3, 1966 (see Appendix 1 for complete text of the patent). The patent in suit contains eight claims, but only claims 3, 5 and 8 are in issue in this case.

2. Plaintiff CMI Corporation (hereinafter cited as CMI) is a corporation in the State of Oklahoma having its principal place of business in Oklahoma City, Oklahoma.

CMI manufactures and sells a broad range of automatically controlled road building machines, namely, a dual lane trimmer for finishing highway subgrades in preparation for paving; dual lane and single lane highway slip form pavers for placing either concrete or asphalt; a highway placer-spreader for positioning concrete ahead of the highway slip form paver; concrete finishers; a single lane trimmer known as the T-200; a suburban slip form paver made in various widths; motor graders, and a small slip form paver used to a large extent in slip forming curb and gutters.

3. Defendant Lakeland Construction Co., Inc. (hereinafter cited as Lakeland) is a corporation of the State of Illinois having a regular and established place of business in McHenry, Illinois.

Lakeland, which was formed in 1958, is a construction company engaged primarily in all facets of road and highway construction and has, within the six years immediately preceding the filing of the complaint in this case, within the Eastern Division of the Northern District of Illinois and elsewhere, used the accused Models 70 and 71 slip form concrete laying machines.

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4. Defendant Miller Formless Co., Inc. (hereinafter cited as Miller Formless) is a corporation of the State of Illinois having a regular and established place of business in McHenry, Illinois.

Miller Formless was formed in early 1970 and has, within the six years immediately preceding the filing of the complaint in this case, manufactured and sold, within the Eastern Division of the Northern District of Illinois and elsewhere, the concrete laying slip form machines identified as Models 70 and 71.

5. Plaintiff, the owner by assignment of the '026 patent, contends that the manufacture, use and sale by defendants of slip form concrete laying machines, identified as Models 70 and 71 and frequently referred to as curb and gutter machines, infringe each of the claims in issue.

6. Defendants contend that the claims in issue of the patent in suit are invalid in that, *inter alia*, (a) the subject matter was anticipated under the provisions of 35 U.S.C. §102; (b) the machine disclosed in the patent in suit is inoperable; (c) the subject matter of the claims in issue was obvious within the meaning of 35 U.S.C. §103; (d) the patent in suit fails to comply with the provisions of 35 U.S.C. §112; (e) the subject matter of the claims in issue is not patentable over the subject matter disclosed and claimed in U. S. Patent No. 3,203,846 issued to the same patentees; and defendants contend that the claims in issue have not been infringed.

The Patent in Suit

7. The patented invention is directed to the support and automatic control of a road building machine of the type which requires precise control of its height and lateral slope relative to a grade reference, such as a previously finished surface or a wire or string line, extending alongside the path of travel of the machine. Examples of machines requiring such precise control are paving machines

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and graders used in providing a finished or smooth surface. The essence of the invention is in supporting one side of the machine with fore and aft supports, such as hydraulic rams, connecting the frame to wheels or endless track units, and supporting the opposite side of the frame of the machine with a single support at the center of the frame, wherein the fore and aft supports are controlled by sensing the height of that side of the machine relative to the grade reference (surface or string line) and the single support is controlled either by a pendulum or by sensing the height of that side of the frame relative to a second grade reference to control the lateral disposition or slope of the frame.

8. The claims in issue of the patent in suit read as follows:

Claim 3:

A construction machine comprising:

a main frame;

at least one working tool carried by said main frame for road engagement;

a track frame on each side of said main frame;

an endless track mounted upon each track frame and extending longitudinally thereof in the direction of travel;

propulsion means engaging each of said endless tracks for moving said machine;

main frame support means connecting each side of said main frame to one of said frame tracks,

one of said support means including a pair of hydraulically operated rams including linkage means for respectively providing vertical adjustment means for the front and rear of one side of said main frame,

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the other of said support means including a single hydraulically operated ram and linkage means for pivotally connecting the other support means between a midportion of said track frame and said main frame for providing vertical adjustment means for the other side of said main frame;

a hydraulic pressure and return system connected to said rams;

valve means disposed between said system and each of said rams and carried by said main frame;

valve actuating means included in each of said valves,

the valve actuating means associated with said pair of rams being disposed for engagement with a grade control means disposed along one side of the path to be traversed by said construction machine,

and the valve actuating means associated with said single ram being disposed for engagement with a slope control means.

Claim 5:

A construction machine in accordance with claim 3 in which said slope control means comprises

a pendulum means carried by said main frame and movable in a plane transverse to said path.

Claim 8:

A construction machine comprising:

a frame,

a working tool carried thereby,

a pair of ground engagement means disposed adjacent opposite sides of said frame for accommodating transportation thereof.

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a pair of frame support means connecting opposite sides of said frame to respective ground engagement means adjustably supporting said frame thereon,

one of said frame support means including a pair of extensible members connected to said frame at spaced points,

the other frame support means being pivotally connected to one of said ground support means substantially centrally thereof and including a single extensible member,

actuating means operatively connected to said pair of extensible members including a control lever adapted for operative engagement with an exterior grade control reference disposed along a path to be traversed by said construction machine,

and actuating means for said single extensible member operative to control the transverse slope of said frame relative to said path.

*The Development of the
Patented Invention*

9. In 1958 or 1959, Raymond Gurries and John Curlett, the co-patentees of the patent in suit, were on a highway construction job in Winters, California. While on that job, they observed a slip form paving machine made by Guntert & Zimmerman. The Guntert & Zimmerman machine was a two-track machine with the frame of the machine supported on the tracks by a hydraulic ram at each corner of the frame, with each hydraulic ram being controlled by a separate sensor riding a string line on the respective side of the machine. Gurries and Curlett observed that as the tracks of the Guntert & Zimmerman machine were moving over uneven terrain, one of the four hydraulic rams was frequently not supporting the weight of

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that corner of the frame of the machine. They also observed that the rear two hydraulic cylinders or rams were connected to the frame for vertical movement and the machine incorporated a horn type warning system which would be activated when either one or the two rear hydraulic cylinders had moved down with respect to the frame a predetermined distance to give a warning to the operator that that corner of the frame was not then being supported, in order that appropriate corrective measures could be taken to adequately support that corner of the frame and prevent upsetting of the frame.

10. Following the observation of the problem in supporting the Guntert & Zimmerman machine, Gurries and Curlett began considering a solution to that problem. The first solution they conceived is disclosed in U. S. Patent No. 3,230,846, issued on January 25, 1966, on an application filed May 15, 1961. The '846 patent discloses and claims the use of two hydraulic rams on one side of the machine individually controlled by sensors riding a string line, while the opposite side of the machine is supported by fore and aft hydraulic rams which are locked together in parallel and interconnected by a common conduit and controlled either by a sensor at the middle of the frame riding a string line or by a pendulum. In operation of that machine, oil is either added or removed from one of the commonly connected rams while the other is in a fixed position, or is transferred between the commonly connected rams as required to keep the center or midpoint of the frame at that side of the machine at a given elevation even though the track supporting the frame at that side of the machine is moving over uneven terrain. This creates a three-point suspension system.

11. Approximately one year after filing the application for the '846 patent, Gurries and Curlett conceived the use of a single hydraulic ram or cylinder to support the frame of a machine at one side, rather than using two interconnected cylinders at that side, for directly supporting the

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center of the frame at that side at a precise height as controlled either by a sensor riding a string line or by a pendulum. This latter conception resulted in the filing of the application for the patent in suit on July 3, 1962.

12. The sole material difference between the machines described by the '846 and '026 patents is the substitution of a single, hydraulically operated ram at the midpoint of one side of the machine for two interconnected rams which effectively create a point of suspension at the midpoint of the frame. There are, of course, minor mechanical differences which relate to the different linkages required by the substitution of the rams.

*Paper Patent and
Commercial Success*

13. The '026 patent has never been reduced to practice; it has no existence apart from the patent certificate. No known drawings of the '026 subject matter were ever made by the patentees or anyone else, either before or since the patent application was filed. The construction machine illustrated and described in the patent in suit has never been manufactured and sold either by plaintiff or by Gurries Manufacturing Co., plaintiff's predecessor in title.

14. Curbmaster of America, Inc. of Cedar Falls, Iowa, was granted a license under the patent in suit, Patent No. 3,249,026, by agreement dated January 1, 1971. As of January 31, 1974, Curbmaster of America, Inc. had paid royalties in the total amount of \$86,506.84 pursuant to that license agreement. This is the only license issued under the patent.

15. The construction machine illustrated and described in the patent in suit was analyzed in principle on or about November 1961, but no documents relating to such analysis have been found and no such construction machines were tested by the patentees or by the plaintiff.

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16. Plaintiff has never marked any of the construction machinery which it has manufactured, used or sold with the number of the patent in suit, namely, 3,249,026.

17. The fact that Curbmaster of America, Inc. was granted a license under the patent in suit does not enhance the validity of the patent in suit under the circumstances of this case. The evidence clearly established that the Curbmaster machine contains features not disclosed in the '026 patent in suit and has definite advantages over the '026 structure. The structure of the Curbmaster machine is disclosed in U. S. Patent No. 3,635,131. While the Curbmaster structure incorporates three hydraulic jacks, two of which are mounted on the left side and one on the right, the structure also significantly utilizes an extensible member which aids in stabilizing the righthand side of the Curbmaster machine. The patent in suit, in every embodiment, discloses for the side of the machine where only one ram is used only a single extensible member with a ram associated therewith and link means for stabilization; the Curbmaster machine uses two extensible members and no link means.

During the prosecution of the application which eventuated in Curbmaster patent No. 3,635,131 through the Patent Office, the '026 patent in suit was cited as a reference against the application. The Court deems it significant that in distinguishing the structure of the Curbmaster machine over that disclosed in the '026 patent, the importance of the second extensible member acting as a stabilizing guide was emphasized. The mule or mold on the machine is flexible, which is an added important feature.

18. The Court finds that the patent in suit is nothing more than a "paper patent," an established term used in patent law to signify a patent showing a conception that has never been built by the patentee, proven to be of sound design, manufactured, sold or distributed.

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Plaintiff failed to prove that the specific features claimed in the '026 patent in suit were the reason for the grant of the license to Curbmaster or account for any commercial success which has accrued to the Curbmaster machine. Indeed, the fact that only one licensee exists can be taken as evidence against commercial success.

Presumption of Validity

19. The patent in suit is not entitled to the usual presumption of validity under 35 U.S.C. §282 for a number of reasons. First, the Examiner failed to consider pertinent prior art. There is no presumption of validity with respect to the prior art exemplified by Allen patent No. 2,128,889, issued in 1938, the Bucyrus-Erie development of 1937 vintage, the disclosure of Etgen patent No. 2,440,502, issued in 1948, and Gurries' own developments of the late 1950's. Also, both the Patent Office Examiner, Nile C. Byers, and the patent agent, Paul B. Fihe, who was in charge of the prosecution of application Serial No. 207,207, which ultimately issued as the '026 patent in suit, admittedly were unaware of a slope controlled alternative embodiment disclosed in German patent No. 1,010,980, the principal prior art reference.

20. The specification of the said German patent which was published on June 27, 1957 refers to the elimination of one guide wire on one side of the machine by the use of a "waage" which the parties stipulated in advance of trial should be translated as either a "balance" or a "spirit level."

21. German Patent No. 1,010,980 was cited as a reference against application Serial No. 110,087 in the initial Patent Office Action of April 17, 1962 and Edward B. Gregg obtained a copy of the said German patent prior to filing an amendment in the Patent Office on October 15, 1962. Application Serial No. 110,087, which ultimately issued on January 25, 1966 as U. S. Patent No. 3,230,846, was drafted

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in the office of Edward B. Gregg and filed in the Patent Office on July 3, 1962 as a continuation-in-part of application Serial No. 110,087 by Edward B. Gregg.

22. In the initial Office Action of October 30, 1963 in application Serial No. 207,207, received by Edward B. Gregg on November 4, 1963, the Examiner rejected all claims as being unpatentable over German Patent No. 1,010,980 in view of Alberts Patent No. 2,883,594.

23. On January 6, 1964, attorney Paul B. Fihe was granted a power of attorney by Gurries Manufacturing Company to represent applicants John Curlett and Raymond A. Gurries in application Serial No. 207,207 and to prosecute the said application. This power of attorney was accepted by the Patent Office on January 20, 1964. On January 6, 1964, attorney Paul B. Fihe was granted a power of attorney by Gurries Manufacturing Company to represent applicants John Curlett and Raymond A. Gurries in application Serial No. 110,087 and to prosecute the said application. The power of attorney was accepted by the Patent Office on January 28, 1964.

When Fihe took over prosecution of application Serial No. 207,207, a copy of German Patent No. 1,010,980 which had been cited as a reference by the Patent Office in its first Office Action of October 30, 1963 was in the application file. In this first Office Action, the Examiner also applied Alberts patent No. 2,883,594 which disclosed a three-point suspension mechanism for maintaining a platform for use in either surveying or rocket launching in a desired horizontal plane by the utilization of a level sensor.

24. Fihe looked at the drawings of the German patent and was able to ascertain therefrom that in the structure of the German reference there were two tracks, one on each side of the main frame, and four cylinders, one at each corner of the frame, providing a connection and support between the frame and the respective track. Since he had

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no working knowledge of the German language, Fihe showed the German patent on only one occasion prior to April 1964 to a graduate student at Stanford University. Fihe asked the student to read over the entire patent and put to him one question, namely, whether there was any suggestion or mention anywhere in the German patent of using a three-point rather than a four-point suspension. The student replied that there was not. Other than this single instance involving the German graduate student, Fihe never sought any other translation or interpretation of the German patent.

25. Examiner Byers testified on deposition that in applying the German patent as a reference he relied on the drawings of that patent since he had no working knowledge of the German text; he did not rely on the text of the patent.

26. During the prosecution of the patent, Fihe represented that the German patent did not suggest a slope-sensing mechanism. On deposition, Fihe stated that a "spirit level," such as is disclosed in the German patent as an alternative embodiment, is "a slope-sensing mechanism." He also stated that at the time he made that representation to the Patent Office he was not aware of the existence of a slope sensor in the form of a spirit level in the German patent, and he further stated that the German patent does disclose that by using that slope sensor, one of the two grade wires may be eliminated.

27. At the time he made the above representations to the Patent Office, Fihe was familiar with Gurries, et al patent No. 2,883,777 which disclosed the use of pendulums for slope control in road graders, and with Gurries, et al patent No. 3,000,122 which disclosed a system for slope control using a pendulum valve or manually operated valve, but he did not advise the Patent Office of the existence of these patents during prosecution of applications Serial Nos. 110,087 and 207,207.

28. In the second Office Action of April 15, 1965, all claims pending in the application were finally rejected, the Examiner noting that the "German patent as modified [by Alberts] is deemed to anticipate the structure claimed." On August 10, 1965, Fihe filed a Notice of Appeal to the Board of Appeals from this final rejection. In his October 8, 1965 response to the April 15th action, Fihe repeated his representations concerning the lack of a slope sensing mechanism.

29. The Court is concerned that no real translation of the German patent was made by either the agent or, apparently, the Examiner during the pendency of the prosecution of the patent even though it was cited as a prior art reference.

30. When German Patent No. 1,010,980 was cited by the Patent Examiner, Mr. Byers, during the prosecution of the application for '026, the German patent was located in the Examiner's search files in either class 94, subclass 46, or class 94, subclass 46 of the AEC (automatic elevation control) Digest. Class 94, subclass 46 was reclassified as class 404, subclass 84 in the years 1971, 1972, 1973 and all of the foreign patents previously maintained by the Examiner in the Examiner's files of class 94, subclass 46 and class 94, subclass 46 AEC have been transferred into the Examiner's files of class 404, subclass 84. As of December 5, 1973, a copy of German Patent No. 1,010,980 could not be found in the Examiner's search files of class 404, subclass 84.

The Patent Examiner, Mr. Byers, does not recall whether or not there was a translation of German Patent No. 1,010,980 in the Examiner's search files when he found such patent and cited it during the prosecution of the application for the patent in suit.

As of December 5, 1973, a copy of French Patent No. 1,095,178 which corresponds to German Patent No. 1,010,980 was located in the Patent Examiner's search files for class

37, subclass AL, which had the notation "some translation in German 1,010,980 94/AEC" on the face thereof.

French Patent No. 1,095,178 was published on May 27, 1955 and was received in the U. S. Patent Office on August 22, 1955, and is the French equivalent of German Patent 1,010,980. The specification of French Patent 1,095,178 refers to the mounting of a balancing device on a construction machine whereby the elimination of one guide wire on one side of the machine may be effected.

Double Patenting and Operability

32. The alleged invention defined in the '26 patent in suit is not patentably distinct from that defined in the earlier-issued '846 patent. The sole material distinction between the claimed invention of plaintiff's '026 and '846 patents was the alternate use of two interchangeable and well-known equivalent vehicle suspension means. Both the prior art and basic mechanics indicate that the substitution of one cylinder (as shown in the '026 patent) for two cylinders, which are effectively operating as one, as disclosed in the '846 patent, is not only the full mechanical equivalent but also is merely a design choice.

33. The Court recognizes that while the complete disclosures of copending applications of the same inventors are not prior art as to each other, under the doctrine of double patenting the claim of the subsequently issued patent must show a patentable and unobvious invention beyond the claim of the first. As stated above, such is not the case here.

34. On the eve of trial, which was over seven years after the allowance of the patent and almost two years since the filing of the suit, plaintiff filed in the United States Patent Office a document entitled "Terminal Disclaimer Under Rule 321" disclaiming the terminal part of the '026

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patent in suit which would extend beyond the expiration date of the earlier issued '846 patent with the result that both of the said patents will expire on the same day, namely, January 25, 1983.

35. The Court finds that the filing of such a terminal disclaimer was ineffective since disclaiming the terminal portion of the life of a later issued patent in this case cannot avoid the invalidity of the later filed patent to the same subject matter. The Court is further concerned with the timing of the disclaimer, coming at such a late date, especially since defendants' answer had raised the issue several years earlier.

Status Under 35 U.S.C. §112

36. The Court believes that while some of the language is ambiguous, as "linkage means," this does not differ materially from the type of language used in patents in this art and the basic concept is understandable. Several of the alleged ambiguities are either transpositions or equivalent terms for previously used language, and the Court believes that the patent is operable and is not fatally defective in light of 35 U.S.C. §112.

Anticipation Under 35 U.S.C. §102

37. The Court believes that the patent in suit is not anticipated by U. S. Letters Patent 2,128,889 (Allen). While the Allen patent discusses the use of hydraulic pressure to maintain a grading machine at a certain level through the use of three pumps, the patent does not disclose the use of slope and horizontal controls to constantly adjust the machine while in motion. Certain other differences exist, so that anticipation is not present. However, Allen is pertinent on the question of obviousness.

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Obviousness—35 U.S.C. §103

38. Having considered the scope and content of the prior art, the level of ordinary skill in the art and the difference between the claims and the prior art, the Court finds that within the meaning of 35 U.S.C. §103, the subject matter of claims 3, 5 and 8 of the patent in suit as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art.

The patentees of the patent in suit properly defined the area of pertinent or analogous prior art when they stated in their patent (Plaintiff's Trial Exhibit Number 1, col. 7, lines 52-58):

"In the description hereinabove frequent reference is made to 'road building' and to 'road building machines.' It will be understood that the invention has wider application. For example, it can be applied to earth working and/or paving machines used for such purposes as airport construction, slab construction, agricultural purposes, canal lining, etc."

39. The relevant prior art with respect to three-point suspension systems and grade and slope control mechanisms was highly developed at the time the patentees conceived the structure embodied in their '846 and '026 patents.

40. The prior art showed the interchangeability of one or two parallel rams, various three-point suspensions, various grade and slope controls using external lines and pendulums and every other aspect of the '026 patent in suit.

41. During the prosecution of the application for the patent in suit, the Patent Examiner considered and cited the U. S. Patents of Earley 2,844,882; Guntert 2,864,452; Alberts 2,883,594 and Shea 3,029,716; as well as German Patent 1,010,980. Other pertinent prior art includes the Etgen Patent 2,440,502, Vogelaar 2,801,511, Orelind 2,796,718, and Allen 2,128,889, the various Bucyrus-Erie develop-

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ments including Knox 2,202,009, and plaintiff's predecessor's own work in the field. The Court also relies on the testimony of defendants' expert, Professor Strait.

42. The German patent discloses a two-track road building machine wherein the frame of the machine is supported at each side by fore and aft hydraulic rams connected between the frame and the respective track frame providing a four point support. Each hydraulic ram is individually controlled by a sensor riding on a string line.

The specification of the German patent also refers to the use of a "waage" which may be translated into English as either a "balance" or a "spirit level." Such specification further makes mention of the elimination of one guide wire by the use of a "waage." This effectively allows for control of one side of the machine by two guide wires and the other side by some balancing device. The German patent also discloses the interchangeability of either electric or hydraulic control means (see Defendants' Exhibit 3, translation of the German patent, page 2). This is relevant in that other references utilize electric control means.

43. The patent of Alberts discloses a platform leveling apparatus wherein the platform is supported by three jacks to provide a three point support. The jacks are controlled by a pendulum device which is sensitive along two axes at right angles to one another to maintain the platform level.

44. On several occasions the Patent Examiner rejected the application in light of the German and Alberts patents. The combination of the teachings of the two patents appears obvious and is merely a mechanical operation.

45. The patent of Earley discloses a slip form paving machine wherein each of the four corners of the frame of the machine is supported by a hydraulic jack connected to a wheeled truck. Each hydraulic jack is individually controlled by a sensor riding a string line.

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46. The Guntert patent discloses a two track, slip form paver wherein the frame of the machine is supported at each side by fore and aft hydraulic cylinders or rams connecting the frame to the respective endless track. Each of the hydraulic rams is individually controlled by a sensor riding a string line.

47. The patent of Shea discloses an asphalt paver wherein the cross slope of the screed, which controls the thickness of the asphalt laid by the machine and which is a working tool, is controlled by a pendulum.

48. The Allen patent teaches a road construction machine which supports working tools on a three-point suspension from two longitudinally extending ground supports in the precise manner taught by Curlett and Gurries in the '026 patent. Allen uses two rams on one side of his machine at points B and C to control the grade or elevation of his main frame and working tools and a third ram A on the opposite left side of his machine to control cross slope of his tool. Allen also provides actuating controls on an operator's platform designated by the numeral 75. Allen does not specifically disclose automatic reliance upon an external grade reference to actuate the controls.

49. The inventor's own prior activity serves as evidence of the obviousness of the patent.

50. On January 15, 1954, Raymond A. Gurries started the Raymond A. Gurries Manufacturing Company which within a year was incorporated as Gurries Manufacturing Co.

51. John Curlett was first employed by Raymond A. Gurries Manufacturing Company on January 16, 1954 as vice president and chief engineer, a title he retained until 1966 when he severed his employment with Gurries Manufacturing Co.

52. John Curlett has been employed as a project engineer with FMC Ordnance Engineering since 1966.

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53. The first product that the Raymond A. Gurries Manufacturing Company actually made and sold was an 80 foot long land planer which was an agricultural machine for leveling farm land.

The theory of the Gurries land planer was that the cutting edge of the blade would lie exactly on a straight line from the ground contact point of the front truck wheels to the contact point of the tail caster wheel. The hydraulic system of the Gurries land planer was designed so as not to respond to small surface irregularities but to adjust itself for the average contour of the ground and thereby maintain a smooth cut or fill.

The Gurries land planer incorporated a system of hydraulic servo valves to maintain a particular plane. This was Raymond A. Gurries' first personal experience with servo valves and the land planer was used by him as a proving ground for developing and gaining experience in servos. The land planer in its early stages of development did not employ any system for controlling the transverse orientation of the blade. Many of the Gurries land planers in varying sizes were manufactured and sold.

54. In 1955 or 1956, Gurries Mfg. Co. tried using a 50 foot land planer with a 10 foot wide cutting edge on several road building jobs. These land planers which were called "road planers" were sold and used in Colorado, Montana and Wyoming but they did not utilize any system to correct slope or grade or elevation.

55. In late 1956 or early 1957, Gurries Manufacturing Co. built a prototype road builder with a pendulum control for cross slope, an auger screw for conveying the excess material out from the bowl, and a manual control for elevation.

56. Gurries, et al patent 2,883,777, issued April 28, 1959 on an application filed September 20, 1957, discloses a road grader wherein the front of the frame of the ma-

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chine was supported merely by fixed wheels with an oscillating walking beam action between them. The wheels were steerable but they were essentially fixed vertically in relation to the frame.

57. The structure of patent 2,883,777 shows how Gurries first put a cross-slope control on the land planer to use on highway work.

58. Gurries, et al patent 3,000,122, issued September 19, 1961 on an application filed January 19, 1959 discloses essentially the configuration of the GARB-44 machine manufactured by Gurries Manufacturing Co. that was sold to Gordon Ball Construction in 1958 and was used by Ball on on a highway job at Winters, California in 1958.

59. The GARB-44 machine was also sometimes known as the Gurries Automatic Road Builder.

60. The GARB-44, sold and used in 1958, was developed prior to the development of the machines disclosed in applications Serial Nos. 110,087 and 207,207.

61. The GARB-44 was a machine built around a heavy drag-scraper type bowl with wheels behind the scraper and at each side of the long rigid frame. The frame was supported by a front truck having a wheel at each side of the frame.

62. The scraper bowl wheels of the GARB-44 were controlled by a sensitive hydraulic system which operated to adjust the grade or elevation of the scraper blade in reference to (a) an indexing surface, (b) a tight wire or (c) a long wheelbase, the choice of reference being at the option of the operator.

63. The lateral attitude or cross slope of the scraper blade of the GARB-44 was maintained by a pendulum control at an angle selected by an operator.

64. In the GARB-44, the height or elevation of the scraper blade could be held in a desired relationship to the

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long 40 foot wheelbase from the front support wheels to the tail-wheel. This gave a planing or straight line cutting action that rapidly produced a uniform riding surface from rough grade. Three options for scraper blade elevation control were:

- (a) left wire trace—in which the grade wire servo valve operated to automatically hold the scraper blade at a desired height below a tightly stretched piano wire set precisely parallel to the elevation of the finished road;
- (b) left side wheel trace—in which the left side gauge wheel servo valve operated to automatically hold the scraper blade height at a desired height in relation to a pattern surface directly to the left of the machine;
- (c) right side wheel trace—same as left side wheel with the desired pattern surface to the right of the machine.

An additional servo valve operating simultaneously with the scraper blade height servo valves took its signal from a sensitive and precisely dampened pendulum. This valve controlled the lateral attitude or cross slope of the entire machine. The operator was able to set and vary the cross slope from 0 to 25% fall, left or right.

65. The hydraulic system of the GARB-44 was a type known as a closed-center system wherein the pump supplied a constant head of pressure, ready for immediate action with the slightest signal from the servo valves.

66. The 1962 Operator's Manual for the Gurries Automatic Road Builder accurately describes the structure and operation of all of the GARB machines that were sold, including the first of such 1958 machine.

67. Gurries Manufacturing Co. has never manufactured a machine using tracks instead of wheels.

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68. Prior to 1965, the closest machine to the drawings of patent 3,230,846 that Gurries Manufacturing Co. had ever designed was the GARB-44 used by Ball on the highway job at Winters, California in 1958.

69. Long prior to filing their applications which resulted in the issuance of the '846 and '026 patents, Gurries and Curlett had obtained considerable experience with three-point suspensions for purposes of stability as evidenced by the Gurries land planer and the GARB-44 Road-builder. The inventors also had experience utilizing two rams locked together mechanically in parallel and in the utilization of a pendulum to control slope. None of these developments was made known to the Patent Examiner.

70. The prior art also includes the Bucyrus-Erie Co. excavators, which were used as early as 1937. The shovel utilized four hydraulic supports, however, two were mechanically linked and created a three-point suspension. This concept was embodied in Knox patent 2,202,009.

71. Defendants adduced substantial proofs through their expert witness, Professor Strait, concerning the teachings of Etgen 2,440,502, Vogelaar 2,801,511 and Orelind 2,796,717 and Professor Strait's own personal experience and knowledge to establish that the interchangeable use of one or two hydraulic rams or cylinders was well known in the prior art. None of these patents was cited or considered by the Patent Office during the prosecution of the application which issued as the patent in suit.

72. Even assuming a presumption of validity, which does not exist here, defendants have proved by clear and convincing evidence that, measured against the prior art as exemplified by Allen 2,128,889, the Bucyrus-Erie 950-B series of commercial machines, Knox 2,209,009, the disclosures of Etgen 2,440,502, Vogelaar 2,801,511 and Orelind 2,796,717, the patentees' own developments as evidenced by the Gurries land planer the GARB-44 and the '846 patent,

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and the disclosures of the prior art references of the late 1950's considered by the Patent Office, there are no "differences" within the meaning of the *Graham v. Deere* obviousness test claimed in the '026 patent.

73. Confirmation of the Court's obviousness determination is found in the following facts:

a) Prior to 1962, one had the option within the skill of the art to provide grade control either with a single sensor on one side of the machine aligned with the working tool or with two sensors in the front and back.

b) Prior to 1962, it was well known within the skill of the art that if one wanted to get three-point suspension from four-point suspension, one put a central support in the middle connecting the main frame to two spaced ground-engaging means.

c) Prior to 1962, three-point suspensions were widely known for supporting rigid machines, and such three points of suspension could be obtained either by connecting two hydraulic cylinders in parallel at the corners or by placing a single cylinder in the middle.

d) Prior to 1962, the selective use of manual adjustment of slope, automatic pendulum slope control, or the use of two lines on opposite sides of the machine for slope control was an option available in the construction machine art.

74. Confirmation of the Court's obviousness determination is also found in the admissions of plaintiff's witness Kohls (a) that it was the state of the art as of 1961 that grade could be controlled with either a manual valve control or a grade sensor, laid on the ground; (b) that it was prior art in 1961 to selectively use manual control, a pendulum or two grade wires to control cross slope; (c) that the fact that in a rigid construction machine with four adjustable supports only three operate at any one time to

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support the load is "fundamental" and as fundamental or obvious as "the difference between a four-legged and a three-legged stool."

75. Each and every element of the '026 combination was admittedly old. The well known elements employed in the '026 structure took on no new quality or function from being brought into concert, and the alleged improvement resulting from their unification is wanting in any unusual or surprising consequences. Putting an old and well known three-point suspension on an old and well known two-track machine was not only obvious but was also merely a design choice.

76. The elimination in the '026 structure of one of the corner rams and the positioning of a single ram at the midpoint of the frame for stability was an obvious mechanical expedient and did not rise to the dignity of patentable invention.

77. The record is devoid of any evidence tending to establish that the structure of the patent in suit ever produced any unusual or surprising result.

Violation of 37 CFR 1.133

78. The Court believes that no violation of this section occurred since the substance of the interviews of October 8 and 11, 1965 were set forth in the text of the amendments and were incorporated by reference when the fact that the interview occurred was mentioned.

The Accused Device

79. The first slip form curb and gutter machine made by the Miller brothers, Charles, David and Allen (presently officers of Miller Formless) was constructed on the premises of Lakeland in approximately March 1967. This prototype machine employed four endless tracks, with an adjustable support at each of the four corners of the frame of the machine supporting the frame from an endless track. That

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machine was used on one job site, but was removed immediately because it did not perform satisfactorily.

80. In about June 1967, the Miller brothers constructed a second prototype slip form curb and gutter machine which was similar to that illustrated and described in Miller patent 3,606,827. As shown in that patent, this machine employs four tracks, with one side of the frame being supported by fore and aft hydraulic cylinders connected to individual endless tracks. The opposite side of the frame is supported by a pair of hydraulic cylinders located at the mid-portion of the frame and mechanically tied together to act as one. The latter hydraulic cylinders are connected to the front and rear endless tracks on the respective side of the machine through a walking beam. The structure results in a three point support for the frame of the machine.

81. Between the construction of the first prototype in about March 1967 and the second prototype in about June 1967, the Miller brothers reviewed up to three hundred possible constructions by sketching and diagrammatic simulation. The machine completed in June 1967 was successfully used for commercial work by Lakeland.

82. These 1967 prototype machines were constructed on Lakeland's premises in non-working hours by the Miller brothers on their own time. They worked mornings before work, nights after work, Saturdays, Sundays, and holidays using salvage materials from worn-out pieces of equipment available at Lakeland.

83. Application Serial No. 774,014 was filed in the U. S. Patent Office on November 7, 1968. This application subsequently issued as Miller Patent 3,606,827 on September 21, 1971.

84. In May 1969, the Miller brothers constructed a slip form curb and gutter machine in accordance with the drawings and description of the Miller Patent 3,606,827.

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85. Approximately in May 1970, Miller Formless constructed a slip form curb and gutter machine designated the Model 70 which basically conformed to the drawings and description of the Miller Patent 3,606,827. There were several differences, however. Among other things, the Model 70 employed a pendulum type cross slope control made by Honeywell Inc.

86. In March 1971, Miller Formless first constructed its Model 71 slip form curb and gutter machine which is shown and described in Miller Patent 3,710,695.

87. Each of the Miller Formless Models 70 and 71 slip form curb and gutter machines utilizes a pair of endless tracks on track frames at each side of the frame. One side of the frame is supported by fore and aft hydraulic rams or cylinders connected to the respective side of the frame and pivotally connected to the track frame of the respective endless track. Each of these hydraulic rams is enclosed in a telescoping housing which transmits lateral forces between the frame and the respective endless tracks in the same manner as the "stabilizer" used in the Curbmaster of America machine. The opposite side of the frame is supported by a pair of hydraulic rams mechanically interconnected and located at the mid point of that side of the frame. The lower end of each of these latter hydraulic rams is pivotally connected to the center of a walking beam, and the opposite ends of the walking beam are in turn pivotally connected to the track frames of the endless tracks on that side of the machine. These latter two rams are also enclosed in telescoping housings. The fore and aft hydraulic cylinders are individually controlled by grade sensors riding a grade line and the pair of hydraulic rams mechanically interconnected at the center of the opposite side of the frame are controlled by pendulum type cross slope control.

88. The Miller Formless Model 71 slip form curb and gutter machine was first used in commercial work about mid-April 1971 by defendant Lakeland on a job for the

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State of Illinois involving the laying of curb and gutter along Route 173 in northern Illinois.

89. The Miller Formless Model 71 slip form curb and gutter machine was first sold to Highway Supply, Inc., Jessup, Maryland, on or about February 5, 1971 by Miller Formless. Negotiations leading to the culmination of this sale commenced early in January 1971.

90. On or about May 6, 1971, R. L. Chaides Construction Company of Santa Clara, California, took delivery of a Miller Formless Model 71 barrier wall machine and a freestanding curb and gutter mule. The order stated that the said machine was "subject to approval to city, county, state specification and inspection."

91. Some time in 1971 this machine was used by the R. L. Chaides Construction Co. to lay curb and gutter in San Jose, California, and the machine successfully laid between 400 and 600 feet of curb and gutter in that city.

92. Also in 1971, R. L. Chaides Construction Co. used the Miller Formless machine on the first and third days in a three-day period to lay between 2,000 and 3,000 feet of curb and gutter in a subdivision in the City of Campbell, California. The machine was operated by a man from Miller Formless on that job. Approximately 200 to 300 feet of the curb and gutter had to be removed and replaced by hand at the direction of the City Inspector for Campbell, California, because said curb and gutter did not meet the water flow test specification of the City of Campbell.

93. The R. L. Chaides Construction Co. currently uses a curb and gutter machine designated the "Easi-Pour" which is manufactured by Huron Mfg. Corp. of Huron, South Dakota. According to George F. Gonzales, a foreman for Chaides, some of the curb and gutter laid by this machine has been removed.

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94. Gonzales has been involved in some curb and gutter laid by hand which had to be removed for failure to meet specifications.

95. The walking beam concept embodied in the Miller Formless Model 71 curb and gutter machine was developed prior to any awareness by defendants of the patent in suit.

Infringement

96. Plaintiff failed to sustain its burden of proof on the infringement issue.

97. The manifest weight of the credible evidence established the existence of substantial differences in means, operation and results between the accused Miller Models 70 and 71 and the claimed structure of the patent in suit. As noted above, the basic concept of a plane being determined by three points, and this being the most stable structure dates back at least to the time of Euclid. The issue here is how the plane can best be determined and how other desired functions can be accommodated in one machine. The evidence indicates that the patent in suit and the accused devices do not perform the same functions in the same way, nor do they achieve the same result.

98. To aid its understanding of the structure and principles of operation of the accused Miller machines, the Court had the benefit of viewing two motion pictures which graphically illustrated the versatility and maneuverability of the Miller Formless curb and gutter machine. The machine includes a combination of four extremely accurate sensors separately adjusting four independently steerable tractors forming front and rear units and a five-point suspension system which virtually straightens out rolling uneven terrain.

99. Miller Models 70 and 71 have been afforded patents known as Miller Patents 3,606,827 and 3,710,695. The accused machines are unlike the '026 patent. They are

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suspended from five points of connection supported on four individual tractors resulting in unique slope, elevation and steering correction. The steering correction results from pivotal movement of either the front pair of tractors as in automobile steering, the rear pair of tractors as in steering the rear of a fire engine hook and ladder, or both producing direct transverse movement of the frame without any turning whatsoever.

100. The left and right front tractors are tied together with cross tie rods so that they steer together just like an automobile. These tie rods are below the frame of the machine and below the hydraulic adjustable supports and form an integral part of the ground-engaging front end tractor unit. The two rear tractors are similarly tied together as a traction unit and this rear unit functions to steer the machine as well as provide compensation for ground unevenness.

101. There is no similar structure either disclosed or claimed in the '026 patent. To the contrary, the '026 patent shows a two track system. It has no steering, nor steerable front and rear units and no transverse tie rods.

102. The four-track system of the accused device is fundamentally different in structure and function than the two track system of the '026 patent and is not merely a splitting of one device into two. It also provides completely different modes of grade and slope adjustment.

103. The front and back tractor systems of the accused machine are entirely separate from one another and are steerable independently of one another so that in the operation of the machine it is possible to turn just the front tracks and not the rear. In actual operation, this is commonly done. It is possible to turn both sets of tracks so they both turn in the same direction enabling the machine to move transversely of its longitudinal axis. A maneuver of this type is impossible for a two-track machine of the type shown and claimed in the '026 patent.

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104. The accused devices also contain various other elements which distinguish them from the patent in suit. The method of connecting the frame to the tracks differs substantially. The accused devices do not use direct linkages, but rather utilize a "saddle," and several sets of extensible members. Furthermore, the track frames are not connected to the main frame as the patent requires. Instead, each tractor is free of the main frame and the front and rear tie rods connect the opposite front tractors and opposite rear tractors together as a steerable unit. This aids in the steering ability of the machine and provides for greater precision.

105. The Court finds that the requirement of claim 8 that there be "a pair of ground engagement means disposed adjacent opposite sides of said frame for accommodating transportation thereof" is not met by the four-track systems. "Pair" must be interpreted to mean two. The four-track system is not the equivalent of the two track system. Although both systems are designed to go from one point to another, their method of operation, structure and results achieved differ.

106. The Court finds that the Miller Models 70 and 71 are not the equivalent of the '026 structure defined in the claims in suit because the said Miller Models are different in structure and they do not perform substantially the same function as the patented device, in substantially the same way to achieve the same result.

107. The Court finds that the Miller Models 70 and 71 do not have the linkage means specifically required by claims 3 and 5 and constructively required in claim 8. In those accused models there is no track frame connected with a linkage means to provide vertical adjustment between the track frame and the main frame.

108. The Court notes that the accused devices have been patented and have achieved commercial success.

Evaluation of Expert Testimony

109. In view of the circumstances of this case, the Court deems it advisable to comment briefly on the nature of the expert testimony presented by the parties.

110. Eugene Kohls, presented to the Court by plaintiff as its expert witness principally on the issue of infringement, had been associated for over 50 years with Ira Milton Jones & Associates in Milwaukee. He was admitted to practice before the Patent Office as a patent agent in 1930 and was admitted to the Bar in 1936. He has been continuously engaged in the patent practice since 1930 specializing primarily in the preparation and prosecution of patent applications. He had acted as a patent expert in approximately 12 prior cases. He has had no engineering training.

111. Prior to testifying, Kohls had never had any engineering experience nor had he had any practical experience in the field of vehicular machinery, including construction machinery, agricultural machinery, or earth-moving machinery and he emphasized that he was not putting himself forth as a technical expert in those fields. He also stated that he had no practical knowledge with respect to vehicle suspensions. While Kohls had seen a Miller machine in a parked position, he had never seen the Miller Models 70 and 71 machines in actual operation and, indeed, Kohls has never seen any machine operate in curb and gutter work.

112. Defendants' expert, Professor John Strait, received a B.S. Degree in Mechanical Engineering from Purdue University in 1938 and an M.S. Degree in Agricultural Engineering from the University of Minnesota in 1945. At the time of trial, he was a Professor of Agricultural Engineering at the University of Minnesota, a position he has held since July 1965, having taught at that university in the field of agricultural engineering continuously since 1938.

113. Professor Strait has specialized in the field of agricultural machinery and power units, dividing his time

equally between teaching and research activities. A course designated "tractors" which he has taught involves a detailed study of the tractor engine, the chassis, power transmission and control systems. He has also been responsible for advising most of the graduate students working for advanced degrees in the area of power machinery. He has had experience in hydraulic controls and the response of hydraulic systems to controls. He has authored approximately 50 publications or articles of a technical nature and in the past 15 years has testified as an expert witness in nine cases, certain of which involved hydraulically operated and controlled machines used in the construction and farm industries.

114. In preparing himself to testify on defendants' behalf, Professor Strait studied the patent in suit, its file history, the various file wrapper references and additional prior art patents as well as the Curlett '846 patent. Additionally, he studied commercial literature, reviewed certain of his own files, viewed movies, talked with people versed in the use of curb or formless concrete-laying machines including the Miller brothers and a contractor and his foreman in Bloomington, Minnesota, who were actually using the Miller Formless machine in laying curb. He was at that construction site for approximately five hours. He also spent the better part of a day at the Miller Formless plant seeing slip form paving machines being assembled and had an opportunity to actuate the control systems of the accused machine in the factory and note the response of the actuation of those control systems.

115. The Court finds that the theoretical and legal speculations and deductions of Kohls are entitled to little weight compared to the judgments of Professor Strait based as they were on a well informed study of the actual operation of the Miller Model 71 machine.

CONCLUSIONS OF LAW

1. The Court has jurisdiction of the parties and of the subject matter of this suit. Venue is proper in this district.

2. Plaintiff is the owner, by assignment, of the patent in suit, United States Letters Patent No. 2,249,026, entitled "Construction Machines," issued May 3, 1966.

3. Defendant contends that the '026 patent is anticipated in light of the *Allen* patent. The Court rejects this contention. In order for there to be anticipation, it is necessary that the invention and prior art have the same elements, united in the same way, and performing the same function. *Shelco, Inc. v. Dow Chemical Co.*, 466 F.2d 613, 614 (7th Cir. 1972). As found above, the two patents are different and anticipation is not present.

4. The Court also rejects defendants' claims regarding invalidity based upon 35 U.S.C. §112, i.e., that the claims were indefinite. The patent description is definite enough to instruct a person with ordinary skill in the art as to the construction of the device and as to the limits of the claims.

5. With respect to the defense of obviousness, under 35 U.S.C. §103, the scope and content of the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art is to be resolved. Against this background, the obviousness or unobviousness of the subject matter is to be determined. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966); *Scott Paper Co. v. Fort Howard Paper Co.*, 432 F.2d 1198, 1204 (7th Cir. 1970); *Deep Welding, Inc. v. Sciaky Bros., Inc.*, 417 F.2d 1227, 1232-33 (7th Cir. 1969); *Appleton Elec. Co. v. Efengee Elec. Supply Co.*, 412 F.2d 579, 582 (7th Cir. 1969).

6. Courts should scrutinize combination patent claims with care proportioned to the difficulty and improbability of finding invention in an assembly of old elements, especially where all of the claims of the patent in suit are

directed to a combination which merely unites old elements with no change in their respective functions and which results in no effect greater than the sum of the effects of the elements taken separately. *Great Atlantic & Pacific Tea Co. v. Supermarket Equip. Corp.*, 340 U.S. 147, 152-53 (1950); *Anderson's-Black Rock, Inc. v. Pavement Salvage Co., Inc.*, 396 U.S. 57 (1969); *Continental Can Co. v. Old Dominion Box Co.*, 393 F.2d 321 (2d Cir. 1968).

7. It is a well established principle that a mere carrying forward of a thought, a change only in form, proportions or degree, the substitution of equivalents which do the same thing in the same way, by substantially the same means with better results, is not such an invention as will sustain a patent. *Smith v. Nichols*, 21 Wall. 112, 119 (1875); *Schreyer v. Chicago Motocoil Corp.*, 118 F.2d 852 (7th Cir. 1941); *B. F. Sturtevant Co. v. Massachusetts Hair & Felt Co.*, 122 F.2d 900, 907 (1st Cir. 1941).

8. The presumption of validity of a patent is rebuttable and may be substantially weakened, if not destroyed where, as here, pertinent prior art relied upon by the defendants was not considered by the Patent Office. *Scott Paper Co. v. Fort Howard Paper Co.*, 432 F.2d 1198, 1203 (7th Cir. 1970); *T.P. Laboratories, Inc. v. Huge*, 371 F.2d 231, 234 (7th Cir. 1966).

9. The machine in suit is obvious in light of the pertinent prior art. A person skilled in the art would have found the combination obvious. See *Speakman Co. v. Water Saver Faucet Co., Inc.*, ___ F.2d ___ (7th Cir. May 28, 1974).

10. Double patenting exists where the alleged differences between the claims of the two patents involved do not rise to the level of patentable invention. *Miller v. Eagle Mfg. Co.*, 151 U.S. 186, 198 (1894); *Weatherhead Co. v. Drillmaster Supply Co.*, 227 F.2d 98, 102 (7th Cir. 1955); *Graham-White Sales Corp. v. Prime Mfg. Co.*, 237 F.Supp. 694, 707 (E.D.Wis. 1964); *aff'd per curiam*, 343 F.2d 534 (7th Cir. 1965).

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11. Co-pending applications on which patents are granted to the same inventors must not only constitute invention over the prior art, but also must be patentably distinct from each other to avoid double patenting. If double patenting is found, the later of the two patents is invalid. *Weatherhead Co. v. Drillmaster Supply Co.*, 227 F.2d 98, 101 (7th Cir. 1955).

12. Prior art may be considered in determining whether the second patent, in this case the '026 patent, is a patentable invention over the first. See *Application of Ornitz*, 347 F.2d 586 (C.C.P.A. 1965). The prior art in the present case makes it clear that the exchangeability of one ram in the middle for two which are linked together mechanically and operate as one was well known and was obvious.

13. The filing of a terminal disclaimer, three days before trial, does not obviate the vices of double patenting and will not serve as a rebuttal to the double patenting defense in this case. The '026 patent is invalid for double patenting. See *Hays v. Brenner*, 357 F.2d 287, 290 (D.C.Cir. 1966); *Sterling Varnish Co. v. Louis Allis Co.*, 149 F.Supp. 826 (E.D.Wis. 1957); compare *M. Hanger, Inc. v. Cut Rate Plastic Hangers, Inc.*, 372 F.Supp. 88, 93 (E.D.N.Y. 1974); see also *Application of Thorington*, 418 F.2d 528, 533-34 (C.C.P.A. 1969); *Application of Purdy*, 393 F.2d 1010 (C.C.P.A. 1968); *C-Thru Prod., Inc. v. Uniflex, Inc.*, 262 F.Supp. 213 (E.D.N.Y. 1966), *aff'd*, 397 F.2d 952 (2d Cir. 1968); cf. *United Lens Corp. v. Doray Lamp Co.*, 93 F.2d 969 (7th Cir. 1937).¹

¹ Plaintiff's reliance on *Technitrol Instruments Corp. v. Coleman Instruments Corp.*, 255 F.Supp. 630 (N.D. Ill. 1965), *aff'd*, 385 F.2d 391 (7th Cir. 1967) is misplaced. It should first be noted that in affirming the district court, the Court of Appeals did not discuss the double patenting issue or the validity of the terminal disclaimer. In its determination of the case, the district court made a number of findings. The case there differed from the instant case in that it concerned a subcombination patent with a combination patent, whereas the instant case

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14. Invalid patent claims cannot be infringed. *Pambello v. Hamilton Cosco, Inc.*, 377 F.2d 445, 447 (7th Cir. 1967); *Toro Mfg. Corp. v. Jacobsen Mfg. Co.*, 357 F.2d 901, 904 (7th Cir. 1966); *Simmons Co. v. Hill-Rom Co.*, 352 F.2d 886, 889 (7th Cir. 1965).

15. The burden with respect to infringement is on the plaintiff to prove by a preponderance of evidence. *Becker v. Webcor, Inc.*, 289 F.2d 357, 360 (7th Cir. 1961); *United States Rubber Co. v. General Tire & Rubber Co.*, 128 F.2d 104, 108 (6th Cir. 1942).

16. In determining whether an accused device infringes a valid patent, resort must be had in the first instance to the words of the claim, but mere application of claim phraseology is not alone enough to establish infringement since there must be real identity of means, operation and result. *Business Forms Finishing Serv., Inc. v. Carson*, 452 F.2d 70, 76 (7th Cir. 1971); *Warner & Swasey Co. v. Held*, 413 F.2d 229, 232 (7th Cir. 1969); *Skirow v. Roberts Colonial House, Inc.*, 361 F.2d 383, 391 (7th Cir. 1966); *North Star Ice Equip. Co. v. Akshun Mfg. Co.*, 301 F.2d 882, 886 (7th Cir. 1962).

Thus, the claims of a patent cannot be considered in a vacuum, detached from the description in the patent specification, but rather must be interpreted in the light of the patent as a whole, the prior art, and the file history of the patent. *Business Forms Finishing Serv., Inc. v. Carson*, 452 F.2d 70, 76 (7th Cir. 1971); *Leach v. Rockwood & Co.*, 404 F.2d 652, 656 (7th Cir. 1968).

17. Since the patent in suit is not of pioneer quality, but is in a crowded art, and whatever advance made was of a very narrow character, the patent must be limited on

¹ (Continued)

is concerned with the same complete invention. Further, other issues, such as multiple suits, are possible here. See also *Sterling Varnish Co. v. Louis Allis Co.*, 149 F.Supp. 826 (E.D. Wis. 1957).

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the issue of infringement to the precise structure disclosed and claimed. *Computing Scale Co. v. Automatic Scale Co.*, 204 U.S. 609, 621 (1907); *Kennatrack Corp. v. Stanley Works*, 314 F.2d 164, 166 (7th Cir. 1963); *Simmons Co. v. A. Brandwein & Co.*, 250 F.2d 440, 450 (7th Cir. 1957); *Beegle v. Thomson*, 138 F.2d 875, 878 (7th Cir. 1943).

18. Under the doctrine of equivalents, a device infringes if it performs substantially the same function as the patented device, in substantially the same way, to achieve the same result. *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 608 (1950); *Ellipse Corp. v. Ford Motor Co.*, 452 F.2d 163, 171 (7th Cir. 1971); *Elgen Mfg. Corp. v. Ventfabrics, Inc.*, 314 F.2d 440, 444 (1963).

19. What constitutes equivalency must be determined against the context of the patent, the prior art, and the particular circumstances of the case. *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, *supra* at 609; *Elgen Mfg. Corp. v. Ventfabrics, Inc.*, *supra*; *Fife Mfg. Co. v. Stanford Engng. Co.*, 299 F.2d 223, 226 (7th Cir. 1962). In the present case, as fully discussed in the findings of fact, there is not the identity of means, operation or result, nor performance of the same function in substantially the same way, required for there to have been infringement, even under the doctrine of equivalency, assuming, *arguendo*, the validity of the patent.

20. Claims 3, 5 and 8 of Patent 3,249,026, the only claims in suit, are each invalid.

21. Defendants' counterclaim for a declaratory judgment that Patent 3,249,026 is invalid is granted.

22. The accused Miller Formless concrete laying slip form machines identified as Models 70 and 71 do not infringe either claims 3, 5 or 8 of Patent 3,249,026.

23. The complaint herein is dismissed with costs awarded to defendants.

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24. This is not an exceptional case within the meaning of 35 U.S.C. §285 and, accordingly, defendants are not entitled to an award of attorney fees.

25. Any finding of fact entered herein which may be construed in whole or in part as a conclusion of law shall be so deemed and treated as if set forth as a conclusion of law herein and any conclusion of law entered herein which may be construed in whole or in part as a finding of fact shall be so deemed and treated.

IT IS SO ORDERED.

ENTERED:

(name illegible)

United States District Judge

DATED: January 23, 1975

[APPENDIX]

May 3, 1966

J. CURLETT ET AL
CONSTRUCTION MACHINES

3,249,026

Filed July 3, 1962

3 Sheets-Sheet 1

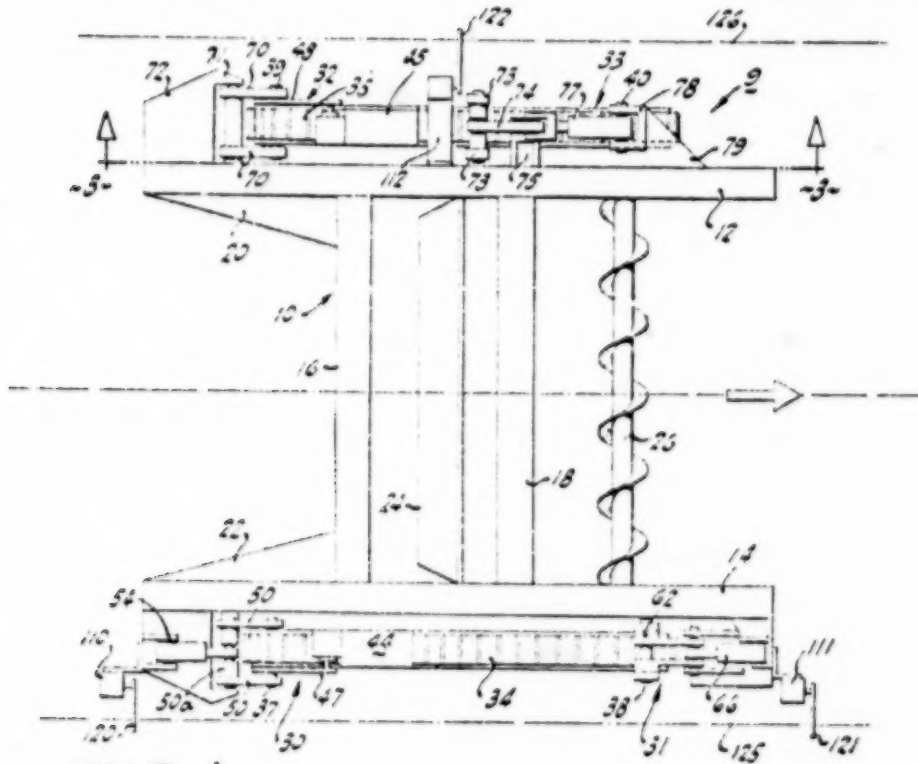


FIG-1

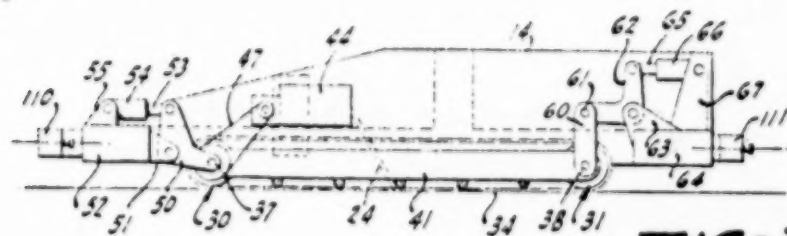


FIG-2

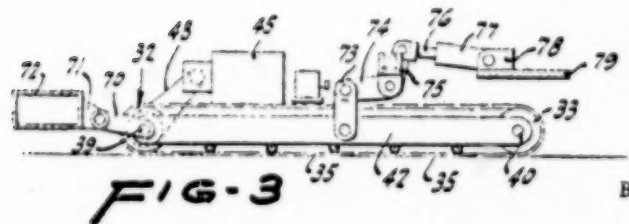


FIG-3

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[APPENDIX]

May 3, 1966

J. CURLETT ET AL
CONSTRUCTION MACHINES

3,249,026

Filed July 3, 1962

3 Sheets-Sheet 2

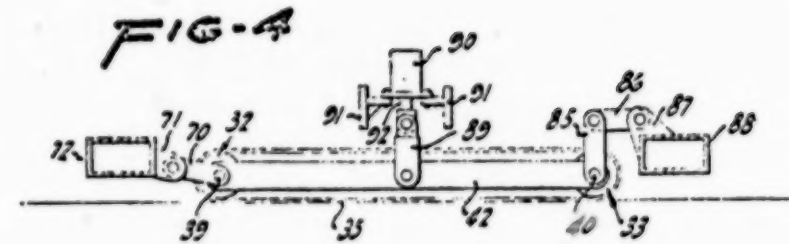
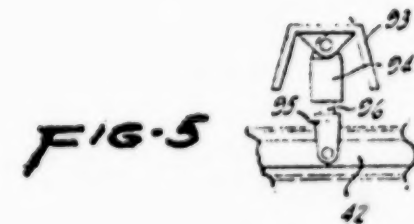


FIG-4



[APPENDIX]

May 3, 1966

Filed July 3, 1962

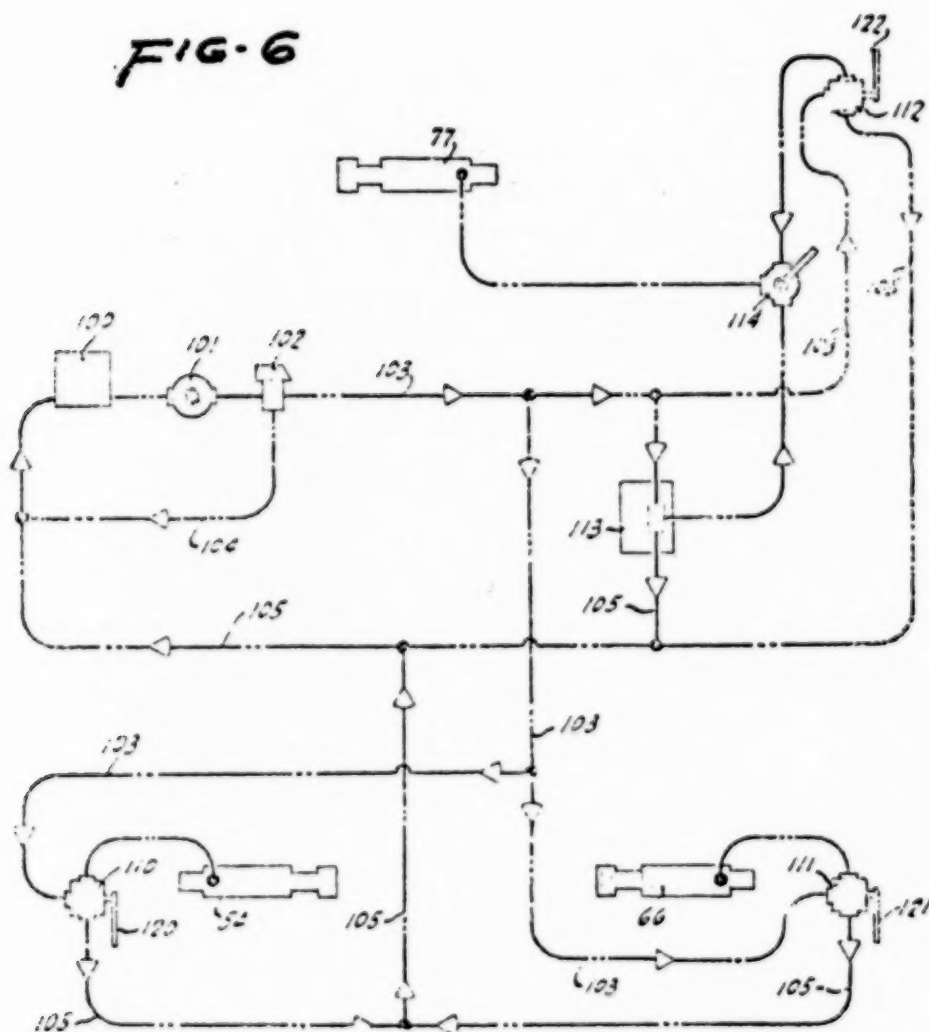
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3,249,026

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FIG. 6



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3,249,026

United States Patent Office Patented May 3, 1966

[column] 1

3,249,026

CONSTRUCTION MACHINES

John Curlett, Los Gatos, and Raymond A. Gurries, San Jose, Calif., assignors to Gurries Manufacturing Co., San Jose, Calif., a corporation of California
Filed July 3, 1962, Ser. No. 207,207
8 Claims. (Cl. 94—46)

This invention relates to construction machines particularly useful in connection with the construction of roads, canals, trenches and the like. More particularly, the invention relates to an improved and simplified automatic control system for maintaining the desired slope and grade of the construction tools as the machine proceeds along a selected path regardless of the existing grade and slope of the path. This application is a continuation-in-part of our application Serial No. 110,087 filed May 15, 1961.

Construction machines of the type to be described are utilized to a great extent for such operations as preparing road beds by scraping, laying one or more sub-bases and bases thereon and finally surfacing the road with black top and concrete.

Reduced to basic essentials, such construction machines comprise: a main frame for carrying one or more appropriate road building tools such as strike-off blades, conveyor screws, scrapers, hoppers, levelers, ground engagement or traction means such as wheels or endless tracks; and adjustable support means for supporting the main frame upon the traction means.

Since the traction means are in direct contact with the ground where the grade, slope and general surface

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conditions are usually different from the road surface level to be constructed and are irregular, and since the road building tools are carried by the main frame, adjustable frame support means are utilized to maintain the plane of the main frame and thereby the road building tool accurately at a predetermined plane reflecting a desired grade and slope irrespective of the grade, slope and irregularities of the ground engaged by the traction means. Of course, if the irregularities of the ground are very great, the demands made upon the adjustable frame supports may be somewhat reduced by utilizing angle blades mounted to the front of the main frame and maintained at the level of the working tool to precut a path over which the ground traction units may move.

The term "grade" as used herein refers to the elevation of the path traversed by the construction machine in the direction of travel, i.e., along the road. The term "slope," also known as "cross-grade," as used herein refers to the inclination of the path traversed by the construction machine in a direction perpendicular to the path of travel, i.e., across the road.

A typical adjustable main frame support means of prior art construction machines comprise four hydraulically operated rams connected to, respectively, the four corners of the main frame and to the traction means. Each of the hydraulic rams is controlled independently of the other hydraulic rams either manually by an operator or automatically by reference means such as two grade wires, two grade surfaces or a combination thereof disposed along and outside the road bed to be constructed. In this manner, each of the four corners of the main frame is maintained at a selected height with respect to the respective reference means.

These prior construction machines, because of their four corner control, have certain inherent operational limitations with respect to their stability, versatility and effi-

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ciency. As fully explained in the above referred to copending application, it is necessary to provide two guide levels, one along each side of the road, to control the

[column] 2

grade and slope of the tool-carrying main frame. Furthermore, four independently servo operated corner supports provide what may be termed a four point suspension system. Since only three of the four frame supports can operate at any one time to determine the plane of the main frame, one support is generally not supporting its associated corner. Of course, such an unsupported corner of the main frame will be at the proper height due to the action of the other three supports, but its support will not carry its portion of the weight of the frame when the ground is uneven and drops away since there can be no servo action as long as the main frame is in its required plane. Consequently, the full load of one side of the frame is then carried by a single active support means designed to carry only one-half of the load. Further, this extra weight thrust upon the active support causes a variation of compaction under the traction means to which it is connected and this extra downward movement of the main frame requires correction to bring the main frame back to its proper plane. Since the support of the main frame shifts continually to a different set of three rams, there is extra duty put upon the control system which detracts from the accuracy at which the main frame can be maintained in the desired plane.

The above referred to copending application describes a construction machine which overcomes many of the limitations of the prior art by effectively providing a three-point main frame support utilizing four hydraulic rams. Three point suspension is obtained by operating two hydraulic rams along one side of the main frame in parallel by a single control valve which may be actuated either by a level guide along that side of the machine or by a pendulum operated servo valve. The side of the machine having

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its two hydraulic rams operated in parallel controls the slope of the main frame as fully explained in the copending application.

The present invention involves a further simplification of the invention described in the copending application by providing a three point suspension system for the main frame upon a four cornered traction means by utilizing three hydraulic rams, one of which is constructed to bear a double load. Each hydraulic ram is provided with its own control for automatically maintaining the plane of the main frame to reflect desired height, grade and slope.

By "four cornered traction means" is meant traction means which supports the frame at four points as in a four wheeled vehicle, but it is intended to include, also, endless track and skid-type traction means.

It is an object of this invention to provide a simple and stable support system for supporting the main frame (or the tool if supported independently of the main frame) of a construction machine upon its traction means.

It is a further object of this invention to provide a construction machine for building roads, canals, ditches or the like in which the height and grade of the moving tools is automatically controlled by a grade level maintained along to one side of the path to be traversed by the machine and in which the slope is controlled either by a gravity-operated sensor or by a second grade level.

It is another object of this invention to provide a simplified road building machine having greatly improved stability and versatility, which is more economical to operate than those known heretofore and which distributes the weight of the main frame so that each support means carries a constant predetermined portion of the

It is still another object of this invention to provide a road building machine which includes a more simplified automatic leveling mechanism for supporting the main

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[column] 3

frame, during its advance, at a predetermined and accurately held plane and height regardless of variations in the grade, slope or height of the ground traversed.

In accordance with a preferred embodiment of the road building machine of this invention, the adjustable main frame support means associated with the front and back of one side of the main frame each include a hydraulic ram constructed to support about one-quarter of the load. The rams are conventionally controlled, that is, each of these two hydraulic rams has its own control valve with its own valve actuating member which is actuated either directly, or indirectly as through micro switches of solenoids, by engagement with a level guide placed along one side of the road to be traversed. The other side of the main frame is connected to an adjustable main frame support means which includes but a single hydraulic ram constructed to support about one-half of the load. The double-duty ram is controlled by a control valve whose actuating member is actuated to provide slope control either by directly or indirectly engaging a second level means or a gravity sensor such as a pendulum.

Other objects and a fuller understanding of the invention may be had by reference to the following description, taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a top view of the construction machine of this invention, certain conventional parts of the superstructure having been omitted for greater simplicity;

FIG. 2 is a side elevational view of the right side (looking forward) of the construction machine of FIG. 1;

FIG. 3 is a view taken along line 3—3 of FIG. 1 and shows the left side (looking forward) of the construction machine.

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FIGS. 4 and 5 are views similar to that of FIG. 3, showing further embodiments of the left side of the construction machine of this invention.

FIG. 6 is a schematic hydraulic flow diagram of the control system of this invention; and

FIG. 7 is a perspective view of a schematic control system useful in explaining the operation of this invention.

Referring now to the drawings, in which like reference characters designate like parts, there is shown a construction machine 9 which incorporates the present invention. Machine 9 comprises a main frame 10 having vertically extending side frame members 12 and 14, two vertically extending cross frame members 16 and 18 for connecting side frame members 12 and 14 to one another, and two horizontally extending webs or ribs 20 and 22 for strengthening the connection between cross frame member 16 and side frame members 12 and 14 for additional rigidity of main frame 10.

Suspended between and carried by side frame members 12 and 14 (either directly or indirectly) are road building tools such as striker blade 24 and conveyor screw 26. During operation of machine 9, these tools or at least one of them are in contact with the ground and build the road or dig the channel or lay the base or sub-base or perform some other operation. Of course, a large number of different road building tools may be substituted for or added to blade 24 and screw 26 depending on the particular operation to be performed. In some instances, many different tools are mounted in vertically adjustable mounts to be selectively lowered for ground engagement to perform certain well-known operations. In the case of laying base, asphalt or concrete, appropriate hoppers are carried by main frame 10 carrying the desired material to be deposited upon the road bed.

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Four traction means 30, 31, 32 and 33 associated respectively with the front and rear of each side of main frame 10 serve to support and to propel main frame 10 over the ground to be worked. In the embodiment shown in FIG. 1, traction means 30, 31, 32 and 33 may comprise spoke wheels engaging endless tracks 34 and 35. Wheels 30, 31, 32 and 33 are mounted upon short axles 37, 38, 39 and 40. Axles 37 and 38 are rotatably journaled in bearings mounted in the end portions of a right side track frame 41, as best seen in FIG. 2. Similarly, axles 39 and 40 are rotatably journaled in bearings mounted in the end portions of a left side track frame 42, as best seen in FIG. 3.

It is within the contemplation of this invention to utilize other traction means, such as coarsely treaded tires mounted on wheels such as wheels 31, 32, 33 and 34; flanged wheels running on rails; or skids. Drive units for propelling construction machine 9 over the ground may be provided in the form of individual engines 44 and 45 mounted respectively upon track frames 41 and 42. The drive shafts of engines 44 and 45 may be connected by means of appropriate chain gears 47 and 48 respectively to suitable sprockets rigidly mounted upon shafts 30 and 32 respectively. Of course, other means of propulsion may be utilized such as, for example, a tractor pulling the machine 9. Since various forms of frame construction, traction means and drive unit may be employed, no further particulars thereof are deemed necessary.

Referring now particularly to FIGS. 1 and 2, there is shown at right hand side adjustable main frame support means for connecting support axles 37 and 38 respectively to the front and rear of the right side of construction machine 9. Axle 37 engages, at each of its ends, one arm of a pair of rocker brackets 50 which are pivotally mounted, by means of a bracket 51, to a bolster 52 bolted or otherwise affixed to main frame 10. The other arms

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of rocker bracket 50 are connected by a cross member 50a which is pivotally mounted to a plunger 53 of a hydraulic ram 54 also mounted to bolster 52 by means of a bracket 55. Similarly, axle 38 is rotatably supported, at opposite ends, by a pair of links 60, the other end of which are connected to a cross member 61. Cross member 61 pivotally engages one arm of a pair of rocker brackets 62, which are pivotally supported in a bracket 63 extending upwardly and rearwardly from a bolster 64 rigidly mounted on main frame 10. The other end of rocker brackets 62 are pivotally connected to a plunger 65 of a hydraulic ram 66 which is pivotally mounted on a bracket 67 extending upwardly from bolster 64.

The combination of each hydraulic ram and its associated linkages is referred to as adjustable main frame support means. It is immediately apparent from FIG. 2 that as hydraulic ram 54 extends the rear right corner of main frame 10 is raised due to rotation of rockers 50. Likewise, a contraction of hydraulic ram 66 causes the right front corner of main frame 10 to be lowered due to clock-wise rotation of rocker arms 62. In general, extension of each of the rams 54, 66 will cause movement of the frame in one vertical direction and retraction will cause vertical movement in the opposite direction, thereby raising or lowering the respective corner of the frame.

Referring now to FIGS. 1 and 3, there is shown the adjustable main frame support means for connecting the left side of main frame 10 to traction means 32 and 33. Left rear axle 39 is pivotally connected by means of a pair of links 70 and bracket 71 to a bolster 72 rigidly mounted to side plate 12 of main frame 10. The center of track frame 42 is straddled by and pivotally connected to one end of a pair of links 73, the other end of which pivotally engage a rocker arm 74 pivotally mounted in a bracket 75 rigidly affixed to side plate 12. The other arm of rocker arm 74 is pivotally connected to a plunger 76 of double duty hy-

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draulic ram 77. The main body of ram 77 is pivotally connected to a bracket 78 mounted upon bolster 79 rigidly affixed to said plate 12.

As is immediately apparent by inspection, links 70 pull main frame 10 as track frame 42 is propelled forward by traction means 39. Also, the relative height between the left side of main frame 10 and track frame 42 is determined by the angular position of rocker arm 74. If straddle links 73, connecting rocker arm 74 to track frame 42, are supported and secured to take side loads (loads perpendicular to side plate 12) then the front end of track frame

[column] 5

42 may be left unsupported as shown. In case no side loads can be taken by links 73 or in case additional supports against side loads are desired, a further pair of links may be utilized to secure the front of track frame 42 to side plate 12 in the manner shown and as described hereinafter in connection with FIG. 4.

In operation, extension of hydraulic ram 77 causes counterlockwise rotation of rocker arm 74 which raises the entire left side of main frame 10 and more particularly side plate 12 with respect to track frame 42. Likewise, upon retraction of hydraulic ram 77, rocker arm 74 rotates clockwise causing lowering of side plate 12 with respect to track frame 42.

Also mounted upon main frame 10 are three valves 110, 111 and 112, as will be more fully explained in connection with FIG. 6. Valve 110 has a control lever 120 which is mounted to the rear right side of main frame 10 to control ram 54. Valve 111 has a control lever 121 which is mounted to the front right side of main frame 10 to control ram 66. Valve 112, which has a control lever 122, is mounted centrally along the left side of main frame 10 to control ram 77.

FIG. 4 shows a further embodiment of an adjustable main frame support means for supporting the left side

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of main frame 10 (or more specifically, side plate 12) upon traction means 32 and 33. Rear axle 39 is connected to bolster 72 by means of links 70 in the same manner shown and described in connection with FIG. 3 so that links 70 pull main frame 10 forward. Front axle 40 is pivotally connected by means of a first pair of links 85 which in turn are pivotally connected to the ends of a second pair of links 86. The other ends of links 86 are pivotally mounted on bracket 87 fixedly attached to side plate 12 by way of a bolster 88. The function of links 85 and 86 is to take side loads and to keep track frame 42 parallel to side plate 12.

A link 89, which straddles track frame 42 and is pivotally connected thereto, has its other end pivotally connected to a plunger 92 of a double duty hydraulic ram 90. Ram 90 is rigidly affixed to side plate 12 by means of brackets 91 which extend outwardly from side plate 12. As ram 90 extends, it raises bracket 91 and thereby side body plate 12 with respect to track frame 42.

FIG. 5 shows still another embodiment of an adjustable main frame support means for supporting the left side of main frame 10 with respect to track frame 42. In this embodiment, a bracket 93, rigid with side plate 12, is provided for pivotally mounting thereto a double duty ram 94. The plunger 96 of ram 94 is provided with a link 95 which straddles track frame 42 and is pivotally connected thereto. Rear axle 39 (see FIG. 4) may be fastened to pull main frame 10 in the same manner as shown in FIGS. 3 and 4.

FIG. 6 shows the hydraulic flow diagram in which the three hydraulic rams 54, 66 and 77 are placed to correspond with the placement of the rams in the top plan view of FIG. 1. The hydraulic fluid system for operating the three hydraulic rams includes a tank 100 for holding hydraulic fluid, a pump 101 connected thereto to develop hydraulic pressure, and a conventional regulator and bypass valve 102 connected across tank 100 and pump 101.

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Tank 100, pump 101 and valve 102 define a constant hydraulic fluid pressure system which supplies hydraulic fluid at a predetermined constant pressure to a hydraulic pressure line 103.

Hydraulic pressure line 103 is connected to the input port of hydraulic control valves 110, 111 and 112 and pendulum valve 113. Valves 110, 111, 112 and 113 may be of the three-way closed-center type in which a central plunger communicates the center port either with the high pressure input port or with the low pressure output port. The center port therefore permits flow in either direction; i.e., high pressure from the high pressure input port to the center port when the plunger is in one of its two positions, and low pressure from the center port to

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the low pressure output port when the plunger is in the other of its two positions. Since the particular valve may be of conventional design, no further description thereof is deemed necessary.

As previously stated, high pressure line 103 is connected to the high pressure input ports of control valves 110, 111 and 112 and also to the high pressure input port of a pendulum valve 113. The center ports of control valves 110 and 111 are connected, respectively, to hydraulic rams 54 and 66. The hydraulic rams are extended by the introduction of hydraulic fluid under high pressure and are retracted by the removal of hydraulic fluid under low pressure. A low pressure return line 105 is connected between the low pressure output ports of control valves 110 and 111 and hydraulic fluid tank 100.

The center ports of control valve 112 and pendulum valve 113 are connected to the two input ports of a conventional three-way selector valve 114 which has a single output port and which may be manually operated. The output port of selector valve 114 is connected to hydraulic ram 77. In this manner, selector valve 114 controls whether

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the center port of control valve 112 or of pendulum valve 113 communicates with hydraulic ram 77. Return line 105 is also connected to the low pressure output port of valves 112 and 113.

Valves 110, 111 and 112 are actuated by control levers 120, 121 and 122 respectively, which are connected either directly or indirectly to the center plungers of the valves in a manner well known to those skilled in the art. By way of example, control levers 120, 121 and 122 may be in engagement (directly or indirectly) with grade wires 125 and 126 as shown in FIG. 1 (or with grade surfaces such as pre-fabricated slabs) which are accurately set to a predetermined relation to the grade on each side of the road. Wires would be supported at intervals at a predetermined level by stakes or brackets (not shown) in a manner well known in the art. As machine 9 advances with control levers 120, 121 and 122 engaging, for example, grade wires 125 and 126 any change in the level of main frame 10 with respect to wires 125 and 126 causes the control levers to actuate their respective valves to return main frame 10 to its proper level in relation to wires 125 and 126.

The height of the side associated with hydraulic ram 77 is controlled by lever 122 of control valve 112. If control lever 122 is in engagement with a lever control means such as grade wire 126, it will cause the center of that side of the main frame to correspond to the height of grade wire 126.

FIG. 7 is an illustration of the particular control provided by rams 54, 66 and 77. Rams 54 and 66 respectively support the rear and front of the right side of main frame 10 upon track frame 41 which is provided with a driving endless track 34. Ram 77 supports the center of the left side of main frame 10 upon track frame 42 which is provided with a driving endless track 35. The level of main frame 10 is determined solely by the rams 57 and 66. More particularly, as main frame 10 passes over uneven ground the

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desired level is maintained by keeping main frame 10 at a predetermined height in relation to the right hand grade wire with the aid of rams 57 and 66.

The cross slope, that is the angular inclination of main frame 10 transverse to the direction of motion, is maintained solely by ram 77. More particularly, ram 77 is continually adjusted by a slope control means to provide main frame 10 with the desired slope.

An important advantage realized with the control system of this invention, in addition to increased stability, is that the cross grade may be set by either the pendulum valve 113 or by the lateral template controlled valve 112. Pendulum valves are valves actuated by a pendulum which always assumes a vertical position because of gravity forces acting thereon. Valve 113 is set in such a way that the pendulum closes the valve for a predetermined angular

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position of the valve body (slope) and opens the valve when the valve body angle differs from the predetermined angular position. Depending upon the direction of deviation hydraulic fluid is introduced into or is removed from the ram 77. Such a pendulum valve is fully described and claimed in U.S. Patent No. 2,934,078 entitled "Pendulum Controlled Valve."

By way of summary, the road building machine of this invention may have the height of its tool carrying main frame adjusted in a number of ways. The right side of the main frame is controlled by valves actuated by a lever, or the like, which is operated by a grade wire along the side of the road or by a gauge wheel running on a pre-formed slab laid along the side of the road. In case of multiple lane roads, grade wires are strung first to provide for the proper level of the first lane. Thereafter, the first lane may be used to provide the grade level guide and the valve actuating mechanism actuated by a gauge wheel engaging the first lane surface. Suitable grade wire-

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operated and gauge wheel-operated mechanisms are well known in the art and are shown in our copending application Serial No. 198,392, filed May 11, 1962, entitled "Automatic Level Control System For Construction Machines."

The other side of the tool carrying main frame, with its single ram, provides slope control. Slope control may be obtained in any of several ways. For example, the actuating lever 122 of valve 112 is in engagement with a grade wire strung along the other side of the road. Alternatively the valve 112 is operated by a gauge wheel running on a preformed slab. A third way comprises the use of the gravity operated pendulum valve 113, as explained hereinabove.

Any method of controlling the height of one side may be combined with any method of control of the other side of the main frame with equally good results. For example, one side may be controlled by means of gauge wheels engaging a preformed slab while the other side may be controlled by a lever engaging a grade wire; or the height of the main frame may be controlled with grade wires running along both sides of the road, these grade wires being in engagement with levers for controlling the valves.

There has been described a novel road building machine in which the tool carrying main frame is provided with a three-point suspension with the aid of two standard and one double duty hydraulic rams for greater stability and versatility of operation. Two suspension points are the front and back of one side of the main frame and the third suspension point is substantially at the midpoint of the other side of the main frame.

In the description hereinabove frequent reference is made to "road building" and to "road building machines." It will be understood that the invention has wider application. For example it can be applied to earth working and/or paving machines used for such purposes as airport construction, slab construction, agricultural purposes, canal lining, etc.

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What is claimed is:

1. A construction machine comprising: a main frame; at least one working tool carried by said main frame for ground engagement; a pair of ground engagement means disposed on opposite sides of said main frame, each engaging the ground at positions spaced in the direction of travel; a pair of main frame support means connecting opposite sides of said main frame to respective ground engagement means adjustably supporting said main frame thereon, one of said main frame support means including two fluid pressure operated rams connected to said frame at spaced points and the other of said main frame support means including one fluid pressure operated ram pivotally joined to one of said ground engagement means substantially centrally thereof relative to its direction of travel; a fluid pressure and return system connected to said rams; and normally closed valves disposed between said system

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and each of said rams and carried by said main frame, each valve including a valve actuating means disposed and formed for engagement with a level control means disposed along and outside opposite sides of the path of said construction machine.

2. A construction machine comprising: a main frame; at least one working tool carried by said main frame for ground engagement; a pair of ground engagement means disposed on opposite sides of said main frame, one of said ground engagement means being adapted to engage the ground at positions spaced in the direction of travel; a pair of main frame support means connecting opposite sides of said main frame to respective ground engagement means for adjustably supporting said main frame thereon, one of said main frame support means including a pair of independent linkage means for respectively connecting the front and rear of one side of said main frame to the front and rear respectively of the associated ground engagement

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means, the other of said main frame support means including a further linkage means pivotally connecting the mid portion of the other side of said main frame to the mid portion of the associated ground engagement means; fluid pressure operated rams included in each linkage means; a fluid pressure and return system connected to said rams; normally closed valves disposed between said system and each of said rams and carried by said main frame, each valve including a valve actuating means disposed and formed for engagement with a level control means disposed along the side of the path nearest to the side of said main frame whose height it controls; a gravity operated valve carried by said main frame and connected between said system and the ram in said other main frame support means; and a three-way selector valve connected between the valves operating the last-mentioned ram for selecting one of last-mentioned valves for communication with the last-mentioned ram.

3. A construction machine comprising: a main frame; at least one working tool carried by said main frame for road engagement; a track frame on each side of said main frame; an endless track mounted upon each track frame and extending longitudinally thereof in the direction of travel; propulsion means engaging each of said endless tracks for moving said machine; main frame support means connecting each side of said main frame to one of said frame tracks, one of said support means including a pair of hydraulically operated rams including linkage means for respectively providing vertical adjustment means for the front and rear of one side of said main frame, the other of said support means including a single hydraulically operated ram and linkage means for pivotally connecting the other support means between a mid portion of said track frame and said main frame for providing vertical adjustment means for the other side of said main frame; a hydraulic pressure and return system connected to said rams; valve means disposed between said system

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and each of said rams and carried by said main frame; valve actuating means included in each of said valves, the valve actuating means associated with said pair of rams being disposed for engagement with a grade control means disposed along one side of the path to be traversed by said construction machine and the valve actuating means associated with said single ram being disposed for engagement with a slope control means.

4. A construction machine in accordance with claim 3 in which said slope control means comprises a level means disposed along the other side of said path.

5. A construction machine in accordance with claim 3 in which said slope control means comprises a pendulum means carried by said main frame and movable in a plane transverse to said path.

6. A construction machine comprising: a main frame; a working tool for road engagement carried by said main frame; traction means extending longitudinally in the direction of travel on either side of said main frame; first and second main frame support means connecting the
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front and rear of one side of said main frame to one of said traction means, third main frame support means pivotally connecting the other side of said main frame to the other of said traction means, each of said main frame support means including a hydraulically operated ram for changing its effective vertical length; first, second and third normally closed control valves mounted to said main frame and associated respectively with the rams of said first, second and third support means; a pendulum operated valve responsive to changes of the slope of the said main frame from a preselected slope mounted to said main frame; a three-way selector valve; a hydraulic fluid pressure and return system connected to said control valves and said pendulum valve, said valves including valve actuating means; said third valve and said pendulum valve

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both being connected to said selector valve and said selector valve being connected to operate the hydraulic ram of said third support means in response to said third control valve and said pendulum valve in accordance with the position of said selector valve, said first and said second control valve being connected to independently operate the hydraulic rams associated with said first and second support means, the actuating means associated with said first and second control valves being formed and arranged for engagement with a grade control means disposed along the associated side of the path traversed by said construction machine, the actuating means associated with said third control valve being formed and arranged for engagement with a slope control means disposed on the other side of the path traversed when said selector valve is communicating with ram associated with said third support means with said third control valve.

7. A construction machine in accordance with claim 6 in which said third main frame support means comprises: a cam lever pivotally journaled to said main frame, one end of said cam lever being pivotally connected to one end of the associated ram, the other end of the associated ram being pivotally connected to said main frame; link means [column] 10

pivotally connecting the other end of said cam lever to the associated traction means; and at least one further link means pivotally connecting one end of said traction means to said main frame.

8. A construction machine comprising a frame, a working tool carried thereby, a pair of ground engagement means disposed adjacent opposite sides of said frame for accommodating transportation thereof, a pair of frame support means connecting opposite sides of said frame to respective ground engagement means adjustably supporting said frame thereon, one of said frame support means including a pair of extensible members connected to said

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frame at spaced points, the other frame support means being pivotally connected to one of said ground support means substantially centrally thereof and including a single extensible member, actuating means operatively connected to said pair of extensible members including a control lever adapted for operative engagement with an exterior grade control reference disposed along a path to be traversed by said construction machine, and actuating means for said single extensible member operative to control the transverse slope of said frame relative to said path.

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CERTIFICATE OF SERVICE

This is to certify that three copies of the foregoing Petition for Writ of Certiorari were mailed first class, postage prepaid, to Theodore Anderson and Jim Dowdall of Neuman, Williams, Anderson & Olson, 77 West Washington Street, Chicago, Illinois 60602, on this _____ day of June, 1976.

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